

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
9 September 2005 (09.09.2005)

PCT

(10) International Publication Number  
**WO 2005/083953 A1**

(51) International Patent Classification<sup>7</sup>: **H04L 12/56**, 12/28

(21) International Application Number:  
PCT/US2004/004918

(22) International Filing Date: 19 February 2004 (19.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **ROCKWELL COLLINS INC.** [US/US]; 400 Collins Road, NE, Cedar Rapids, IA 52498 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VAN LANING-HAM, Steven, L.** [US/US]; 5414 Faversham Drive, Richardson, TX 75082 (US). **BARTON, Jeffrey, A.** [US/US]; 420 Highbrook, Richardson, TX 75080 (US). **STEVENS, James, A.** [US/US]; 1102 Ashby Drive, Allen, TX 75002 (US). **YOUNG, C., David** [US/US]; 8204 Strecker, Plano, TX 75025 (US).

(74) Agent: **EPPELE, Kyle**; **ROCKWELL COLLINS INC.**, 400 Collins Road, NE, Cedar Rapids, IA 52498 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

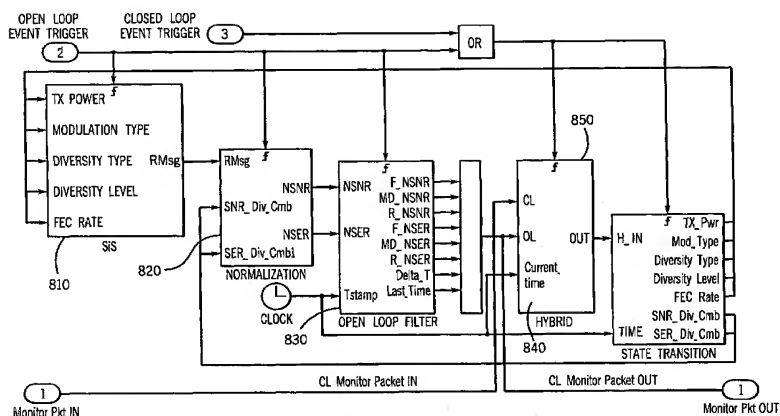
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,

[Continued on next page]

(54) Title: LINK ADAPTION FOR MOBILE AD HOC AND MESH NETWORKS



(57) **Abstract:** A method of selecting linked metric measurements from at least one of open loop and closed loop measurements is disclosed. The method includes sending by a first node a first radio communication and receiving by a second node the first radio communication over a communication link. The method also includes estimating by a second node dynamics of the communication channel using at least one of the variance and mean deviation of linked metric measurements. The link metric measurements are at least one of symbol error rate (SER), packet error rate (PER), frame error rate (FER), bit error rate (BER), signal to noise ration (SNR), and received signal strength (RSS). The method also includes the use of the above link metric measurements by the second node as Open Loop metrics and the sending back of these metrics to the first node for use as Closed Loop metrics by the first node. The method also includes categorizing the dynamics of the communications channel into one of at least two groups based on the estimate. Further still, the method comprises selecting, based on the chosen group, the use of at least one of closed loop link adaption and open loop link adaption of communication link parameters.

WO 2005/083953 A1



EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,

LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

**Published:**

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.